

# AMS San Mateo Testbed and Data

Download Data Zip file: <https://doi.org/10.21949/1500857>

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In order to explore a potential transformation in the transportation system's performance by the Active Transportation and Demand Management (ATDM) and the Dynamic Mobility Applications (DMA) programs in terms of mobility, safety, and environmental benefits, capable and reliable testbeds are proposed for Analysis, Modeling and Simulation. These testbeds provide valuable mechanisms to address this shared need by providing a laboratory to refine and integrate research concepts in virtual computerbased simulation environments prior to field deployments. Six AMS Testbeds were selected to form a diversified portfolio to achieve rigorous DMA bundle and ATDM strategy evaluation: San Mateo (US 101), Pasadena, Dallas, Phoenix, Chicago and San Diego Testbeds. In order to promote the use of the testbeds and data generated during the project within the research community, repositories of data and testbed files are shared on the USDOT's Research Data Exchange.

This repository consists of data sets pertaining to the AMS San Mateo Testbed. The San Mateo Testbed is an 8.5 mile long stretch of the US 101 freeway and State Route 82 (El Camino Real) in San Mateo County located approximately 10 miles south of the San Francisco International Airport. The US 101 freeway is an 8 lane freeway, transitioning to 6 mixed flow lanes plus 2 peak period HOV 2+ lanes. El Camino Real (State Route 82) is a 4 to 6 lane signalized divided arterial with a posted 35 mph speed limit. The US 101 freeway carries between 200,000 and 250,000 Average Annual Daily Traffic (AADT) of which 15-25% are HOV 2+ vehicles. El Camino Real carries between 25,000 and 50,000 AADT.

The San Mateo Testbed was used to model and simulate DMA including: INFLO (queue warning, speed harmonization, and cooperative adaptive cruise control), and MMITSS (intelligent traffic signal systems). Data collected from 2012 was used for the analysis. Four baseline scenarios, combining different levels of demand, incident, and weather conditions were used for testing the performance effects of the DMA on the Testbed.

The Testbed integrates third party software implementing these applications with the Testbed's native VISSIM implementation using VISSIM's com and other interface

capabilities. The Testbed is capable of being integrated with third party software implementing other DMA applications, such as ATIS, IDTO, FRATIS, and R.E.S.C.U.M.E, however; those particular applications were not tested as part of San Mateo modeling effort.

The datasets for AMS San Mateo Testbed are organized into four directories:

1. Cluster Analysis Data
2. Calibration Data
3. Network Files
4. Simulation Output

### **Cluster Analysis Data**

The files in this folder refer to the data used for selecting the representative operational conditions for the San Mateo region. This includes the weather data, Vehicle Miles Traveled (VMT) data and the incident data for the region. Specific details on the data are provided in the metadata file provided in the folder

### **Calibration Data**

The files in this folder refer to the Calibration Data that was used in calibrating the four selected clusters of the testbed. The folder includes a metadata file as well as three .XLSX files. The files refer to the California PeMS (Performance Measurement System) data that was used to carry out the calibration, as well as the final calibration summary data.

### **Network Files**

The files in this folder are the network files that are calibrated to the four clusters and are accompanied with a metadata documentation file. Two types of network files are provided – MMITSS version, where adaptive signal controllers are coded to communicate with the MMITSS ports and Non-MMITSS version, where adaptive signal controllers are coded using internal Vissim controllers. The documentation provides explanation on how to change the market penetration and traffic composition for interested users.

### **Simulation Output**

The files in this folder are the output files from simulation and includes (1) Scenarios Table which lists the scenarios that were simulated as part of the San Mateo network, (2) Scenario Aggregates which includes 15-minute aggregates of simulation data obtained as an average of different random-seed simulations performed under each scenario, (3) Detector Data Sample which consists of sample data from the detectors (Data Collection Devices) coded into the network and (4) Raw Data which consists of

time-step by time-step vehicle attributes collected during simulation. Additional documentation is provided in the specific folder.

To understand more about the scope of the testbeds, users are encouraged to read the following USDOT publications:

1. FHWA-JPO-16-370, ATDM-DMA AMS Testbed Project: Analysis Plan for San Mateo Testbed.
2. FHWA-JPO-16-376, ATDM-DMA AMS Testbed Project: AMS Evaluation Plan.
3. FHWA-JPO-16-377, ATDM-DMA AMS Testbed Project: Calibration Report for San Mateo Testbed.